A Work Project, presented as part of the requirements for the Award of a Master Degree in Finance from the NOVA – School of Business and Economics.

The impact of the Board of Directors' composition on companies' performance

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A Project carried out on the Master in Finance Program, under the supervision of:

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6th January 2016

Abstract

The impact of the Board of Directors' composition on companies' performance

This paper studies the impact that the board of directors' composition has on companies' performance in the Italian market. The research has been carried out by using a sample of 10 Italian companies, across different market sectors, over a period of 10 years (2005-2014).

The characteristics of the BoD taken into consideration are the following:
board size, board diversity (% of female directors), board independence and CEO duality.

Results from the sample data collected concluded that these factors have a statistically significant impact on the performance of the companies that have been analysed.

1 – Introduction

1.1 – Purpose and objectives

Although the question of whether companies are managed in the best interest of shareholders is certainly not new, several financial scandals in the last decades have sparked a renewed interest in mechanisms that can limit managerial discretion, especially when it comes to sensitive decisions that affect the welfare of other economic agents in a company. In line with this trend, an ever-growing amount of academic literature is trying to understand and assess the impact of corporate governance regulations and recommendations on the performance of a firm.

This paper will focus in particular on the relationship between the characteristics of the board of directors and the performance of the firm in the Italian market, both at an operational and financial level. However, before discussing the results and methodology employed in this research, we will have an extensive look at the aforementioned academic literature that surrounds the topic, allowing us to lay the foundations for our findings. Furthermore, it is important to point out that the board characteristics discussed below will be the same aspects that will be chosen as regressors in our later analysis.

1.2 - Literature review

A general definition of the responsibilities of a board of directors can be found in Fama and Jensen (1983), who describe them as being both "the ratification of management decisions" as well as "the monitoring of management performance". The first aspect that this paper takes into consideration is the size of the firm's commitee, that is, the number of directors in a company's board.

Most of the academic research regarding the impact of board size focuses on the optimal number of directors and the structure of corporate boards in the US market as a mechanism of value creation. This comes from the idea that a board approaching the optimum size is presumed to reduce the agency costs that arise from the separation between ownership and control of the company.

Large groups are often seen as less efficient in reaching agreements as well as in monitoring top managers due to the increased coordination costs, thus leading to inferior firm performance (see for instance Kogan and Wallach, 1966).

This theory is confirmed by a significant amount of research studies that examine boards in US companies, such as Yermack (1996) and Eisenberg et al (1998) for example, which lead to the concusion that a small board is more efficient.

Furthermore, Guest (2009), who, by examining the impact of board size on firm performance for a large sample of UK listed firms for a period of over 20 years, found additional evidence that problems of poor communication and decision-making undermine the effectiveness of large boards. However, this view has recently been challenged by Dalton et al. (1999) and Coles et al. (2008) who claimed that larger boards may improve the performance of firms that are particularly complex or operate in multiple segments, thus requiring extensive advice.

Another meaningful study was carried out by Bermig and Frick (2010) who analyzed the effects of supervisory board size and composition on the valuation & performance of all German firms listed in the DAX, MDAX and SDAX over the period 1998-2007.

They used Tobin's Q ratio and the total shareholder return as measures of capital market performance while they employed ROE and ROIC as accounting measures to evaluate the companies' operating performance.

However, altough they find a significantly positive relationship between board size and Tobin's Q ratio, the impact on the total shareholder return is negative. On the other side, with respect to the operating performance, their results were not statistically significant, suggesting that board size is completely irrelevant in this regard.

Further results are reported by Malik et al. (2014), who examined the relationship between board size and firm performance in the Pakistani banking sector, with their most prominent result being the positive relationship between board size and bank performance in this scenario.

The second important aspect that should be discussed when it comes to the board composition is the presence and impact of independent directors in corporate boards. In this regard, Fama (1980) suggests that independent directors, also known as outside directors, can decrease the possibility of managerial collusion, since they introduce an additional source of corporate monitoring beside the usual monitoring performed by the board. Independent directors are professional members of the board who do not have any kind of relationship with the company's business and do not own shares in the company. It is a widespread belief that the presence of independent directors improve the performance of a company by means of their objective view of the company's operations. In fact, outside directors are disciplined by an external labour market which evaluates and sets the prices for their services according to their performance, drastically decreasing their incentives to seek their own interests.

Papers that support this idea may be found in Weisbach (1988), who shows that CEOs of poorly performing firms are more likely to be replaced if firms have a majority of independent directors and Borokhovich, Parrino & Trapani (1996), who find that there exists a positive relationship between the number of outside directors in a board and the probability that an outsider is appointed as CEO.

Rosenstein & Wyatt (1990) further support the argument by reporting higher-than-average increases in the value of firms after additional outside directors are appointed. Researchers also took into consideration the relationship between the number of independent directors and company's takeovers. Such is the case of Cotter, Shivadsani and Zenner (1997) who analyzed the role of target firm's independent directors during takeover attempts.

They found that boards with a majority of independent directors are more likely to use resistance strategies that enhance shareholders' wealth.

Nevertheless, this general approach has been criticised, namely in its supposed monitoring objective. In fact critics, such as Mace (1986), claim that managers dominate boards by choosing outside directors and providing the information the latter are supposed to analyse. Bhagat and Black (1997) find no empirical evidence that the presence of outside directors in the board affects future firm performance while Vafeas and Theodorou (1998) find no significant association between performance and board structure in UK firms.

In a comprehensive survey of the literature, Hermalin and Weisbach (2003) indicate that no statistically significant impact of a firm's number or percentage of outside directors on firm performance has yet been found.

According to the authors, the major weakness of the available research about the impact of independent directors on firm performance lies in the fact that the degree of their independence is unobservable and their appointment is endogenous. In their survey of the most recent research, Coles et al. (2008) confirms the persistence of this issue and again fails to find a statistically significant influence of the board composition.

In line with these conclusions, Raheja (2005) argues that "*the optimal board structure is determined by the trade-off between maximizing the incentive for insiders to reveal their private information, minimizing coordination costs among outsiders and maximizing the ability of outsiders to reject inferior projects*."

Bermig and Frick (2010) further argue that "*the missing link between board size, board composition, and firm performance may be board effectiveness*."

In this respect, they note that, while most of the research on board effectiveness in the US yields mixed findings (for instance Morck et al. 1989 and Bange and Mazzeo 2004), Kaplan (1994) shows that German supervisory boards are effective in the sense that they quickly replace executives when firm performance has been poor or started to deteriorate.

The third relevant aspect of the board composition not covered so far is the controversial matter of board diversity, and in particular, the percentage of female directors on the total number of the board members. In this regard, the extent of the available literature is smaller compared to the other aspects discussed above. Smith et al. (2005) analyzed data available for large Danish firms during the period 1993-2001 and found that the proportion of women in top management jobs and boards of directors tend to have positive effects on firm performance, even after checking for several other firm characteristics.

Liu et al. (2014) focused instead on the Chinese market and reported that boards with three or more female directors have a stronger positive impact on firm performance than boards with two or fewer female directors. In a study of board diversity across 47 countries, Terjesen et al. (2015) found that firms with more female directors have higher firm performance by market and accounting measures. Furthermore, as an interesting point of connection between the topics of female representation and director independence, the authors also show that outside directors do not contribute to firm performance unless the board is gender diversified.

Lastly, the final aspect that is analyzed in this paper regards the concept of CEO duality, that is, the practice of one person serving both as a firm's CEO and board chairman. From the theoretical point of view, this is a controversial point since different theories suggest different results. While the renowned Agency Theory states that CEO duality should negatively affect performance because it compromises the chairman's role of monitoring the CEO; the Stewardship Theory claims instead that, when one person holds both roles, he or she is able to act more efficiently.

A review of the empirical evidence supporting one or the other theory does not lead to certain answers. Donaldson and Davis (1991) find that ROE improved when combining, rather than by separating, the role-holders of the chair and CEO positions. Thus, their results fail to support the Agency theory and lend support to the Stewardship Theory. Similar conclusions are reached by the study of Yang and Zhao (2014), who report that duality firms outperform non-duality firms by 3-4% when their competitive environments change. On the other hand, several other papers, such as Chen (2014) and Moscu (2013), do not find any significant effect of CEO duality on firm performance.

In conclusion, this review has shown that there is no consensus in the academic literature regarding the relationship between board composition and firm performance. Thus, this paper will attempt to empirically assess such relationship by analysing 10 Italian companies listed on the national stock exchange, from 2005 to 2014. However, before turning our attention to the results of the analysis, the next section provides a brief overview of the evolution of corporate governance issues in recent years.

2 - The surge of Corporate Governance

Attention to the topic of corporate governance and related regulations became widespread in Italy towards the end of the 1990s, following a wake of similar developments in all European countries that had been sparked by the publication of the Cadbury Report in 1992. This report was issued by a Corporate Governance Committee that had been established in the UK by the Financial Reporting Council, the Stock Exchange and several accountancy professionals in response to the growing concern related to the standards of financial reporting & accountability. The report sets out recommendations regarding the organization and structure of company's boards in order to mitigate corporate governance failures as well as preventing agency costs from arising.

This event led to the development of codes of conduct and similar recommendation reports in several other European countries, such as the Riuz Cod and Codigo Olivencia in Spain, the Vienot Report in France and the German Corporate Governance Code.

Such codes generally consisted in self-regulating best practices issued by entrepreneurs, professional associations and different institutions. However, it is worth noting that these best practices were added to national legislation only later on, as initially they were not complemented by legally binding rules.

Alternately, in the United States, such regulatory process culminated in the adoption of a federal law in 2002, the Sarbanes–Oxley Act, which established new requirements for American public companies as a response to major accounting scandals such as the Enron case. In particular, the Act defined responsibilities and criminal sanctions in case of misconduct for corporate boards, which were later complemented by regulations issued by the Securities and Exchange Commission (SEC).

2.1 - Evolution of Corporate Governance in Italy

With respect to the Italian context, the first committee for public companies' corporate governance was created in 1999 by Borsa Italiana S.p.A, the authority managing the national stock exchange. This entity issued in the same year the first self-regulating Corporate Governance Code for listed companies (*Codice Preda*), which was later edited and expanded as time progressed.

Italian business law provides for both "one-tier" (most commonly used) and "two-tier" corporate governance system allowing companies to decide which model to incorporate. Under the "one-tier" system, a company is governed by a single corporate board that undertakes both the managing and monitoring functions. On the other hand, under the second system, two separate boards operate independently as board of directors and supervisory board.

The Italian Corporate Governance Code recommends that each board of directors should be composed of both executive and non-executive directors, as well as a minimum number of two independent, or outside, directors.

In the case of companies listed on the FTSE MIB index, the benchmark stock market index for the Milan stock exchange, the Code suggests a number of independent directors equal to at least a third of the total number of directors.

Directors of a company are defined in the Code as independent if they do not have any recent, direct or indirect, relationships with such company that could impair their autonomous judgment ability.

According to data from an evaluation report published in 2014, the average board of directors across Italian listed companies is composed of 9.8 members, of which 2.7 executive directors, 3.1 non-executive directors and 4 non-executive independent directors.

Furthermore, 92% of listed companies comply with the recommendation of having boards with at least a third of independent directors, regardless of the stock market index to which they belong to (Assonime-Emittenti Titoli, 2014).

Figure 1

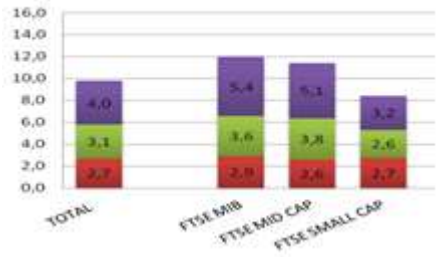

Figure 1 shows the average number of directors in Italian listed companies by stock exchange index. Red corresponds to executive directors, green to non-executive directors and purple to independent directors (Assonime-Emittenti Titoli, 2014).

Beside self-regulating codes of conduct, some rules of law regarding corporate governance were introduced in the Italian legislation. These rules addressed the issue of board diversity and the so-called "pink quotas", as women's representation in boards of directors has come to be known in political debates.

In fact, following the approval of bill number 120 on 12th July 2011, listed companies are now required to have directors of the "least represented" gender at least in a fifth of board positions in the first year and a third in the following years. With the introduction of this law, the number of female directors in listed companies has been steadily growing and at least one female director can be found in almost every company. Furthermore, women are more represented in the boards of high-capitalization companies, especially those belonging to the financial sector, while they are less present in industrial firms (Borsa Italiana, 2014).

Table A

Year	Total	% Total
2008	170	5,9
2009	173	6,3
2010	182	6,8
2011	193	7,4
2012	288	11,6
2013	421	17,9
2014	520	22,2

Table B

Year	Total	% Total
2008	126	43,8
2009	129	46,4
2010	133	49,6
2011	135	51,7
2012	169	66,8
2013	202	83,5
2014	220	90,5

Table A shows the number of women directors in Italian listed companies and as the percentage out of total number of directors, per year (Consob, 2014). On the other hand, Table B shows the number of Italian listed companies in which at least a woman is represented in the board of directors and the percentage out of total number of listed companies, per year (Consob, 2014)

3 – Data Description

The core of this paper lies in an empirical research that attempts to study the impact of board composition on a firm performance, both at the operative and financial market level. Such effect will be evaluated by running statistical regressions on a sample of 10 Italian listed companies, with observations over a period of 10 years (2005-2014).

Table C

Energy	Automotive	Banking	FMCG	Health Care
ENI & ENEL	PIRELLI & BREMBO	UNICREDIT & INTESA SAN PAOLO	CAMPARI & GEOX	RECORDATI & AMPLIFON

Table C shows the full list of the companies, divided by sector, that were taken into consideration in the analysis.

The sample used for this research has the purpose to give a meaningful insight, as well as a cross-section of the Italian market by taking into consideration different sectors of the economy. I chose five markets, which I deemed appropriate for the analysis as well as relevant for the Italian economy, and, for each of them, I chose two companies listed on the Italian national stock exchange, the Borsa Italiana, which best represents the sector they belong to. In this regard, it is worth mentioning that most of the chosen companies are also included in the FTSE MIB, which is the benchmark stock market index for Borsa Italiana, consisting of a capitalisation-weighted index of the 40 biggest companies chosen to represent 10 economic sectors.

For each company, data on the composition of the board of directors was collected, namely the number of directors, female representation, independent directors and CEO duality. The impact of such factors was then assessed on the company's operating performance (proxied by ROA) and stock market performance (proxied by Tobin's *q* Ratio) by means of two panel data regressions, along with a set of control variables. Before discussing the results of the statistical model, the next paragraphs of the paper will present in further detail the data that have been used and the companies that have been chosen for the analysis.

The first segment of the economy that was considered is the Energy market, which relates to the category of all corporations that produce and/or supply any form of energy.

This includes companies involved in the exploration and development of oil & gas reserves, oil & gas drilling, or integrated power firms.

For the purpose of this research, both Eni S.p.A. and Enel were chosen to represent this sector, given their importance and impact in this market. Eni is an Italian multinational oil & gas company, which is among the largest industrial companies in the world. Its name stands for "Ente Nazionale Idrocarburi", which roughly translates to “national hydrocarbons authority”, however, as time progressed, Eni expanded well beyond its original business, reaching and encompassing several other fields such as energy, nuclear power and mining among others.

On the other hand, Enel is a multinational manufacturer and distributor of electricity & gas, operating in more than thirty countries. The company started as a public entity in the early 1960s and then privatized following the liberalization of the electricity market in Italy.

The second sector taken into consideration is the automotive industry, which includes a wide range of companies and organizations involved in the design, development, manufacturing, marketing and selling of motor vehicles and its components. In this case, both Pirelli and Brembo were considered to best represent this industry.

Pirelli is a multinational company and one of the largest tyre manufacturers in the world, having a vast network of distributors and retailers all over the world.

The company has been sponsoring sport competitions since early 1900s and it is heavily involved as a tyre supplier in Formula one (F1). Brembo, on the other hand, is an Italian company that manufactures automotive brake systems, focusing mainly on high-performance vehicles.

The third sector considered in our analysis is the Banking industry with Intesa San Paolo and Unicredit as representatives. Intesa Sanpaolo is a banking group formed in 2007 from the merger between Banca Intesa and Sanpaolo IMI, overtaking Unicredit as the largest bank in the Italian market. It is worth mentioning that the group has adopted a dual corporate governance system where strategic management and control (governed by supervisory board) are separated from the management of the company's business (governed by the management board).

Unicredit on the other hand, is an Italian global banking and financial services company with a vast network of more than fifty markets all over the world.

The fourth sector that is analysed is the Fast Moving Consumer Goods (FMCG) industry, which is represented by both Campari and Geox. Campari is an Italian company active since late 1860s in the branded beverage industry. It produces spirits, wines, and soft drinks.

Under its name, it has Campari Bitter, Cinzano, SKYY Vodka and Aperol among others. Alternatively, Geox is an Italian company that manufactures breathable/waterproof shoes and clothing.

The last sector to be considered is the Health Care industry with Recordati and Amplifon as representatives. Recordati is an Italian pharmaceutical group with international relevance, founded in 1926, which develops, produces and distributes pharmaceutical and chemical products. On the other hand, Amplifon is an Italian company that is involved in diagnosing, producing and distributing hearing equipment.

It is important to highlight that except for the banking sector, most of the other companies chosen are family businesses, which is an important and common aspect of the Italian economy.

The dataset used for the empirical analysis is thus a collection of panel data composed of 100 observations, taken for 10 companies over a period of 10 years, from 2005 to 2014. For each company and for each year, data were collected for the following variables:

- *Return on Asset (ROA*) - defined as $\frac{Net\ Income}{Total\ Assets}$. This is a standard measure of firm operating performance and it has been collected from the Bloomberg financial database (for ROA, the value in the tables below are already in percentage and multiplied by 100).
- *Tobin's q Ratio* - a measure of performance on stock markets that has been first hypothesized in 1968 by James Tobin and William Brainard.

It is defined as

$$\frac{Firm\ Market\ Value}{Total\ Assets\ Book\ Value} = \frac{Equity\ Market\ Value + Liabilities\ Market\ Value}{Equity\ Book\ Value + Liabilities\ Book\ Value}.$$

In order to compute this ratio, market and book values for liabilities are assumed to be equal, hence reducing the formula to: $\frac{Equity\ Market\ Value}{Equity\ Book\ Value}$.

This ratio is a good method of estimating the fair value of a company. It was calculated by using data taken from Bloomberg.

- *Board size* - the number of directors that sit in the company's board of directors.
- *Female representation* - the proportion of women directors out of the total number of directors sitting in the company's board.
- *Independent directors* - the proportion of outside directors (as defined by the Italian Corporate Governance Code) out of the total number of directors sitting in the company's board.
- *CEO Duality*, a dummy variable that takes value 1 in case the chairman of the board holds the position of CEO of the company, and 0 otherwise.
- *A set of dummy variables related to companies' industries* - these are five variables corresponding to the five sectors that are represented in the dataset (energy, automotive, banking, fast-moving consumer goods and health care). For each observation, each of these variables takes either value 1 or 0 according to whether the company belongs to that sector or not.
- *Total Assets* - that is the total amount of assets owned by companies according to their annual balance sheets (figures are in thousand €).

A descriptive overview of the data follows.

Table D

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	100	5.037838	5.921318	-11.2381	26.1293
q_ratio	100	1.947119	1.843642	.2260926	11.78769
board_size	100	12.33	5.14056	7	23
female	100	.1013263	.1073508	0	.38
independent	100	.6014321	.1608906	.2727273	.9473684
total_assets	100	264662022	382256303	335711	1.30e+09

Table D - Summary statistics for the main variables used in the analysis.

As the results suggest, the average return on companies' assets is 5% with and average stock market *q* ratio of 1.95. On the other hand, the corporate governance indicators show that the average number of directors in companies' boards is 12, only 10% of directors is female and more than half of directors (60%) are defined as independent. However, a more useful descriptive analysis of data can be obtained by looking at summary statistics for each industry as seen in Table E below.

Companies involved in the consumer goods and health care sectors seem to offer the greatest ROA on average (9.1% and 7.8% respectively), with banks and automotive companies displaying the lowest one. It has to be remarked, though, that benchmarks of satisfactory ROA ratios in the banking sector are considerably lower with respect to other industries and a value of 1% can already be considered very good as banks are highly leveraged. Regarding stock market performance as measured by q ratios, consumer goods and health care firms report again the highest values on average (3.4 and 2.6 respectively), while energy companies and banks exhibit the lowest ones. As for the board composition, the average number of directors is highest in banks, which report over 20 members on their boards, and lowest in the health care sector, with only 8 directors. Conversely, health care companies have the highest average percentage of women directors at 16.7%, whereas firms in the energy sector report that only 3.6% of their directors are female on average. Banks also display the highest proportion of independent directors on average, while the consumer goods industry have the lowest (77% and 48% respectively).

Finally, the CEO duality phenomenon, that is, the case in which the roles of board's chairman and company's CEO coincide, is a relatively rare occurrence in this sample. In fact, it appears to occur only in the four companies belonging to the health care and automotive sectors, and to be always limited to a few years in any case. In fact, no company exhibits CEO duality during every year of the time period here considered.

Table E

-> sector = automotive

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	20	3.28634	4.630808	-11.2381	9.2131
q_ratio	20	1.642966	.7766036	.577552	3.449237
board_size	20	15	4.352858	10	20
female	20	.1493743	.0700637	.05	.27
independent	20	.5191015	.0755806	.2727273	.6
total_assets	20	4460159	3695466	710426	10808921

-> sector = banking

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	20	.16598	.7530923	-1.5935	1.2612
q_ratio	20	.8117795	.4674143	.2260926	1.751846
board_size	20	20.25	1.860249	19	23
female	20	.0884439	.0771318	0	.2631579
independent	20	.7747654	.1037977	.6086957	.9473684
total_assets	20	697273250	250299920	92876000	1.05e+09

-> sector = consumer

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	20	9.086305	8.44649	-4.5425	26.1293
q_ratio	20	3.440704	3.267542	1.258795	11.78769
board_size	20	9.15	.4893605	9	11
female	20	.0666667	.0911981	0	.2222222
independent	20	.4800505	.1396706	.3333333	.6666667
total_assets	20	1460764	1124100	335711	3517700

-> sector = energy

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	20	4.82299	3.284262	.1392	11.2161
q_ratio	20	1.278605	.6595054	.5444596	2.537029
board_size	20	8.95	.2236068	8	9
female	20	.0355	.1095673	0	.38
independent	20	.7097222	.097264	.5555556	.8888889
total_assets	20	130956050	35963586	50502000	171656000

-> sector = healthcare

Variable	Obs	Mean	Std. Dev.	Min	Max
roa	20	7.827575	4.984321	-1.876	13.4876
q_ratio	20	2.56154	1.052164	.6947273	4.942397
board_size	20	8.3	1.301821	7	11
female	20	.1666468	.1262734	0	.2857143
independent	20	.5235206	.128143	.2857143	.7
total_assets	20	489159888	533236407	667809	1.30e+09

Table E - Summary statistics by industry for the main variables used in the analysis.

4 - Regression model and results

Two regression models were used in order to evaluate the effect of board of directors' composition on firm performance: one is assessing the impact on operating performance as measured by return on assets (ROA) and the other one studying the impact on stock market performance as measured by Tobin's *q* ratio.

In particular, random-effect models are used for panel data due to the fact that any potential company-specific unobserved factors influencing firm performance are unlikely to be correlated with other regressors and they bias the resulting estimates. This assumption is supported by the result of the *Hausman* test that was performed after running both fixed-effect and random-effect regressions. As shown in the following table, the p-value associated to the test is very high, hence we cannot reject the null hypothesis that a random-effects model provides a more efficient estimation.

Table F

```
Test:  Ho:  difference in coefficients not systematic

              chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =         0.14
            Prob>chi2 =       0.9978
            (V_b-V_B is not positive definite)
```

Table F - Hausman test results (Stata output).

Specifically, the two following random-effects regressions are estimated:

$$ROA_{i,t} = \beta X_{i,t} + \alpha + u_i + \varepsilon_{i,t}$$

$$Tobin's\ q\ Ratio_{i,t} = \beta X_{i,t} + \alpha + u_i + \varepsilon_{i,t}$$

where β is a vector of parameters to be estimated, X is a vector of regressors, α is a constant term, u is a company-specific random element and ε is a random error component. The subscript i,t denotes an observation for company i in year t, with $i \in [1,10]$ and $t \in [2005,2014]$.

X includes the following regressors, which have been explained in detail in the previous section of the paper:

- Board of directors' size - variable named $board_{size}$
- % of female directors - variable named $female$
- % of independent directors - variable named $independent$
- CEO duality - dummy variable named $ceo_{duality}$

Furthermore, X includes also the following control variables, which were added in order to obtain more precise parameter estimates:

- Dummy variables for each industry - named $energy$, $automotive$, $banking$, $consumer$. It is important to remark that the dummy for the health care sector is not included in the regressions in order to avoid collinearity.
- Total company assets - variable named $total_{assets}$

Based on what was discussed in the previous sections of this paper, when reviewing the existing corporate governance literature, I hypothesize the following findings, which I will then proceed to test by looking at the actual results of the two regression analyses:

> **H1** - Larger corporate boards of directors should have a negative impact on performance, operating or financial. It is generally believed that large groups are less efficient in reaching agreements and in monitoring top managers due to higher coordination costs, thus leading to inferior firm performance.

H2 - A higher proportion of women directors in corporate boards should positively affect performance, as shown by recent literature on the topic.

H3 - A higher proportion of independent directors in corporate boards should positively affect performance.

The literature, as a matter of fact, suggests that outside directors can decrease the possibility of managerial collusion, since they introduce an additional source of corporate monitoring beside the usual monitoring performed by the board.

H4 - While the impact of CEO duality on corporate performance has long been discussed without coming to any clear conclusion, I expect the negative effect described by the Agency Theory, explained in the literature review, to prevail over the positive one of Stewardship Theory. That is, I expect that combining the roles of CEO and board's chairman within the same person will lead to lower returns since this compromises the board chair's role of CEO monitoring.

The results of the first regression model, with return on assets (ROA) as dependent variable, are shown below in Table G.

We can observe that the size of the board of directors and the presence of women directors or independent directors all have statistically significant influence on companies' measures of return on assets. In particular, larger boards of directors lead, on average, to worse operating performance, whereas a higher proportion of outside directors has a positive effect and increases firm performance on average. Regarding the proportion of female directors, the estimated coefficient seems to suggest a negative impact on ROA. Nevertheless, it should be remarked that this analysis concerns a very limited segment of economic activity and the result of this regression can hardly be an indication of a generalized effect.

This is further shown by the existing literature, discussed in the previous section, which supports the idea that higher female representation in corporate boards is beneficial.

Thus, I am not suggesting to take the regression's result into consideration for policy making as I strongly believe that gender diversity is a crucial component in a company's success.

Another interesting and statistically significant result regards the phenomenon of CEO duality.

The resulting coefficient estimate exhibits a positive effect on firm's ROA, hence implying that the outcome predicted by the so-called Stewardship Theory may prevail over the Agency Theory as discussed in the literature review section of this paper.

As for industry-specific effects measured by sector dummy variables, energy companies seem to exhibit the lowest ROA. However, it is not possible to assess sector-specific effects, if any, due to the fact that all other industry dummies do not yield statistically significant estimates.

The results of the second regression model, concerning the effects on stock market performance as measured by Tobin's *q* ratio, are presented in Table H. Unfortunately, in this model the only statistically significant result among board composition variables is related to the presence of independent directors. This confirms what it has been found already in the case of return on ROA, that is, a higher proportion of outside directors in a company's board improves firm stock market value relative to book value. Furthermore, companies in the energy sector seem to report lower than average financial market returns in this case as well, but once again, it is not possible to assess industry-specific effects, due the fact that the corresponding coefficient estimates are not statistically significant.

Table G

	roa
board_size	-0.581**
	(-2.66)
female	-16.20**
	(-2.81)
independent	10.21*
	(2.40)
ceo_duality	3.275*
	(1.96)
energy	-5.558**
	(-2.67)
automotive	-1.618
	(-0.72)
banking	-2.607
	(-0.86)
consumer	1.478
	(0.67)
total_assets	-1.51e-09
	(-0.66)
_cons	9.099*
	(2.31)
N	100

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table H

	q_ratio
board_size	-0.112
	(-1.39)
female	-1.206
	(-0.56)
independent	3.451*
	(2.19)
ceo_duality	-0.196
	(-0.31)
energy	-2.209**
	(-2.87)
automotive	-0.307
	(-0.37)
banking	-1.407
	(-1.25)
consumer	0.769
	(0.95)
total_assets	-2.81e-10
	(-0.33)
_cons	2.124
	(1.45)
N	100

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table G - Regression parameter estimates (dependent variable: return on assets).

Table H - Regression parameter estimates (dependent variable: Tobin's *q* ratio).

5 – Conclusions

In conclusion, within the sample of the listed companies that were selected during the period 2005-2014, the regression analyses discussed above show that a greater presence of independent directors in companies' boards improve returns to firms, both in terms of operating and stock market performance. This result confirms hypothesis H3 that was postulated earlier on.

Moreover, larger boards of directors and higher proportions of female directors negatively affect firms' operating performance; however these latter factors lack evidence of significant impact on financial market performance. Therefore, at least in partial terms, regression results also confirm hypothesis H1, but reject hypothesis H2.

Regarding CEO/chairman duality, its occurrence has a positive influence on operating performance, thus suggesting a prevalence of stewardship theory over agency theory and rejecting hypothesis H4. Nevertheless, also for this variable, no significant effect is found on stock performance. As for other factors, such as industry-specific effects, their relationship with company performance cannot be precisely assessed due to a lack of statistical significance.

Due to a lack of statistical significance in several parts of this paper's analysis, further research is needed in order to estimate with greater accuracy the magnitude and direction of the effects that were studied.

Finally, it should be pointed out that such results are hardly representative of the Italian economy as a whole and their external validity is thus not guaranteed.

6 – References

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